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BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

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RECONNAISSANCE SURVEY OF FOREST INSECT
CONDITIONS ON THE PASKENTA AND STONYFORD RANGER DISTRICTS
ON THE MENDOCINO NATIONAL FOREST

A communication was received from the Mendocino National Forest on April 21 requesting an inspection of insect conditions on cut-over areas on the Paskenta and Stonyford Ranger Districts. On April 30, R. C. Hall and Boyd Wickman of the Forest Insect Laboratory joined District Ranger L. E. Haan, H. B. Kaufner, and B. Williams of the California State Division of Forestry, and George Sores, Forester and P. Peterson, logging superintendent for Crane Mills, in a reconnaissance of the Crane cutting area. Later, on May 8, Hall made a further check on this area to obtain some information on moisture content of some of the injured trees. On May 9, Hall accompanied District Ranger R. E. James on a reconnaissance of the Stonyford District to inspect conditions on the Dover Lumber Company cutting on Forest Service and private land.

The Paskenta Situation

The inspection of the Paskenta District showed rather heavy Ips damage on the Crane Cutting area on Forest Service ownership, where the cutting had been made from March through July in 1950. This damage was concentrated in large pole groups, principally on southern and western exposures. In addition, there was considerable top injury in merchantable reserve trees on cuttings which had been made several years ago. The Crane Company had started salvaging all of the merchantable infested trees and most of these had already been felled. The Crane Company supplied the services of a falling crew for this inspection and a number of top-killed trees were felled for close inspection. Several merchantable reserve trees with varying degrees of top injury were felled and inspected. Upon examination of these felled trees it was apparent that, in many cases, top injury had been caused by factors other than insects. In some cases, primary insects were associated with the damage while in others no primary insects were found. It appeared that much of the damage to the merchantable reserve trees was caused by moisture deficiency in the top portion. In many

cases, visual damage to the cambium and phloem extended for as much as twenty feet below the faded portion of the crown. In practically every case cambium and phloem injury extended down for at least five feet below the faded portion of the crown. A series of phloem and sapwood moisture samples taken on May 8 showed that there was a marked moisture deficiency in the faded portion of the top and extended downward from 10 to 15 feet below the fade. This deficiency appeared to be equally critical in the sapwood and phloem areas (see Table 2). As this sample is based on only three trees it can not be considered highly significant. An examination of the injured tops of ponderosa pine, sugar pine, and Douglas fir showed that this climatic injury was general in all three species. Top killing in pole-size trees showed evidence of heavy Ips broods in all trees which were examined.

An examination of the weather records at Paskenta and at Patton Mills shows a very critical deficiency of rainfall for the seasonal total from August 1949 through July 50 and for the growing period of April 1 through July 1950 (see Table 1). Seasonal precipitation at Paskenta was 12.80 inches or about 48 percent of normal and at Patton Mills, which is about 7 miles from the area of heavy loss, the seasonal total was 18.99 or about 63 percent of normal. Precipitation during the growing season was .57 inches at Paskenta, or about 15 percent of normal, and 1.58 inches at Patton Mills, or about 36 percent of normal.

This is another outstanding example of the association of Ips damage on cut-over areas with deficient precipitation during the growing season as well as on a seasonal basis. Ips damage also appeared to be closely associated with the cuttings which were made in the late spring and early summer.

The Stonyford Situation

Heavy Ips damage was found on the Dover cutting areas which had been made in the late spring and early summer. In this instance, however, no evidence was found of top killing through moisture deficiency alone. This appeared to be an out and out Ips top-killing proposition, associated with rainfall deficiency and type of logging, and slash disposal. Seasonal precipitation at Stonyford was 13.23 inches or about 58 percent of normal. Precipitation during the growing season was only about 22 percent of normal. This inspection showed a striking difference in the prevalence of Ips damage on Forest Service cuttings and that on private land. In the case of the Forest Service cuttings, tops had been utilized down to about 10 inches and the tops had been lopped. Under this set of conditions Ips damage in the reserve had been moderate. In the case of the cutting on private land, there had been very poor utilization of top material. It was very common to see tops as large as 24 inches in diameter and one was measured which had an average diameter of 38 inches. This low utilization of top material has resulted in a large accumulation of ideal Ips breeding material resulting in heavy loss in the reserve stand on the private cutting.

The Stonyford weather record shows that the seasonal total was 13.23 inches or about 58 percent of normal with only 27 percent of normal for the period of April through July. This is another example of the apparent association between moisture deficiency and heavy Ips damage.

Recommendations

The present policy of salvaging all merchantable top-killed trees, in the Paskenta area, is believed to be a very desirable practice because such trees offer ideal brood material for primary tree-killing insects. An inspection of some of the salvage trees on the Crane Holdings showed that a few of these trees had only minor top injury, sometimes only five feet of the tip killed. It is questionable whether it pays to make a special effort to salvage such trees because they will probably recover with only the tip killed. Perhaps a good rule of thumb to follow in marking trees for salvage would be to mark those trees with progressive fading in the top and to leave those trees that have only the very tip killed and where there is a sharp demarcation between the dead tip and the rest of the crown. It is suggested that salvage operations be carried on in the Stonyford area if it is practical to do so.

The problem of preventing further Ips damage, in these two cutting areas where cutting is planned for the coming season, is one on which we do not have the complete answer. Research work on this problem in northern California for the past five years indicates that there is a very close association between moisture deficiency and Ips damage. If this is a significant association, then we would expect greatly reduced Ips losses in the reserve areas this coming season. Seasonal precipitation in both areas is about normal at the present time and is above normal for the growing season at this point. (See Table 1 and 3). Further study is needed on the importance of time of year of cutting, type of cutting, and amount of total available slash breeding material for Ips build-up, as well as some checking on the importance of lopping of tops. Based on experience and study for the past five years it appears that lopping of tops will minimize the danger of Ips attack in the reserve but it will not alone prevent attack.

It is recommended that lopping and scattering be continued and as far as possible the lopped limbs should be thrown clear of the main trunk, otherwise the severed limbs will shade the bark and no particular reduction in breeding area will be achieved.

TABLE 1

Weather Records at Paskenta and Patton Mill

Month	Paskenta			Patton Mill		
	Normal	1949-50 Actual	1950-51 Actual	Normal*	1949-50 Actual	1950-51 Actual
Aug	.02	.00	.00	.02	.00	.04
Sept	.41	.03	.41	.46	.00	.42
Oct	1.30	.00	3.34	1.46	.02	1.05
Nov	1.81	1.15	2.06	2.03	2.10	2.50
Dec	5.79	.87	4.83	6.48	1.37	5.14
Jan	4.86	5.56	4.03	5.44	8.66	5.55
Feb	4.86	3.03		5.44	2.30	4.12
Mar	3.84	1.59		4.30	2.98	.79
April	2.40	.32		2.69	.68	4.00
May	1.04	.13		1.17	.26	
June	.43	.12		.48	.62	
July	T	.00		.01	.00	
Total	26.76	12.80		29.98	18.99	
Departure from normal		13.96 minus			10.99 minus	
% of normal seasonal		47.9			63.3	
% of normal Apr-July		14.7			35.9	
% of normal Aug-April						83.4

*Estimated Normal

TABLE 2

Phloem and Sapwood Moisture in Topkilled and
Normal Trees on the Crane Cutting Area-Paskenta Ranger District

Distance From Tip	Percent Moisture Dry Wt. Basis					
	Phloem			Sapwood		
	Normal Pond. Pine	10' Faded Top Pond. Pine	12' Faded Top Doug. Fir.	Normal Pond. Pine	10' Faded Top Pond. Pine	12' Faded Top Doug. Fir
5	111	30	40	162	20	25
10	146	44	45	155	26	34
15	149	96	73	159	140	36
25		108	128			81
40	178			130	143	129
Base	185	190	No mea- surement	112	No mea- surement	

TABLE 3

Weather Record at Stonyford

Month	1949-50 In.	1950-51 In.
Aug.	.01	.00
Sept.	.00	.06
Oct.	.00	3.62
Nov.	1.22	2.86
Dec.	1.46	5.82
Jan.	4.89	3.49
Feb.	3.29	2.82
Mar.	1.33	.64
April	.34	2.26
May	.23	---
June	.46	---
July	.00	---

Total 13.23

Departure from normal 9.77 minus

% of normal seasonal 57.5

% of normal April-July 26.6

Total August-April 21.57